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Patent Claims

1. A vehicle security system having
an access control device having one or more action-free authentication elements (1) which can be carried by the user,
a vehicle-mounted access control component (2),
a wirefree access authorization communications channel (4) for access-authorization-checking communication processes between the respective authentication element (1) and the access control component (2), wherein the access control component (2) generates a securing or releasing access control signal for at least one vehicle lock element (7) only when there is a positive access-authorization-checking result,
at least one triggering element (6), which can be addressed by the user, in order to request the generation of a respective securing or releasing access control signal, wherein in this way a respective access-authorization-checking communications process is triggered and said process is carried out successfully only if an authorizing authentication element (1) is in the predefined action range of the access authorization communications channel, and authentication element location means (21) for determining whether, when an access-authorization-checking communication process is triggered, an authorizing authentication element (1) is located on the outside of the vehicle in the action range of the access authorization communications channel (4) and not in the interior of the vehicle or on the outside of the vehicle outside the action range of the access authorization communications channel (4), wherein the vehicle-mounted access control component (2) generates at least some of the possible access control signals for the at least one vehicle lock element (7) as a function of whether the authentication

element locating means (21) determine the presence of an authorizing authentication element (1) on the outside of the vehicle in the action range of the access authorization communications channel (4) and not in the interior of the vehicle or on the outside of the vehicle outside the action range of the access authorization communications channel (4), characterized in that a device is designed for carrying out empty measurement (9), said device sensing an applied field strength at a time at which the vehicle does not emit signal in response to the access authorization communications signal (4) and determining an interference level therefrom and, by taking into account the determined interference level, either transmits an adapted decision threshold value for distinguishing the position of the authentication element (1) to the authentication element locating means (21) or rejects subsequent interrogation signals from the access control component (2), i.e. does not respond to them.

2. The vehicle security system as claimed in claim 1, characterized in that when there is an interference level below a predetermined threshold value the device for performing empty measurement (9) transmits the adapted decision threshold value for distinguishing the position of the authentication element (1) to the authentication element locating means (21), and when there is an interference level above the predetermined threshold value it rejects subsequent interrogation signals from the access control component (2), i.e. does not respond to them.

3. The vehicle security system as claimed in claim 1 or 2, characterized in that the device for performing empty measurement (9) is embodied in the authentication element (1).

4. The vehicle security system as claimed in one of claims 1 to 3, characterized in that when the authentication element (1) is synchronized with the vehicle the device is provided with information about the time at which the vehicle emits pulses, and said device performs the empty measurement correspondingly at times between these pulses.

5. The vehicle security system as claimed in one of claims 1 to 4, characterized in that the authentication element (1) is activated in response to the reception of pulses from the vehicle.

6. A method for operating a vehicle security system, having the steps:
(S1) pulses which are intended for an action-free authentication element (1) and can be carried by a user are transmitted by a vehicle-mounted access control component (2) over a wirefree access authorization communications channel (4) by means of an antenna unit (3),
(S2) the authentication element (1) is activated when pulses are received by the vehicle-mounted access control component (2),
(S3) the authentication element (1) and the access control component (2) are synchronized so that the authentication element (1) knows the time at which the vehicle-mounted access control component (2) emits pulses,
(S4) an empty measurement is performed by a device for performing empty measurement (9) determining an interference level of one or more interference transmitters which happen to be present in the same frequency range in a time period in which the vehicle-mounted access control component (2) does not emit any pulses,
(S5) owing to the interference level determined in step S4, the pulse is rejected, i.e. a response signal is

not transmitted to the vehicle-mounted access control component (2) starting from a predetermined threshold value of the interference level, or if the determined interference level lies below the predetermined threshold value, the threshold value which is adapted to the determined interference level is determined in order to distinguish between an authentication element (1) in the vehicle or on the outside of the vehicle, and this adapted threshold value is transmitted over the access authorization communications channel (4) to the access control component (2) by means of an authentication element locating means (21) in order to be taken into account by the authentication element locating means (21) during subsequent position-determining processes for the authentication element (1).